

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the present application.

Listing of Claims:

Claims 1-14 (canceled)

Claim 15 (previously presented): A device for etching a silicon substrate, the device comprising:

an etching chamber for housing silicon substrates to be etched;

a base on which the substrates are loaded, the base disposed in a bottom location inside said etching chamber;

a gas-supply unit including etching and protective-film-forming gas cylinders and mass-flow controllers, said gas-supply unit connected to the etching chamber via gas-supply lines with said mass-flow controllers intervening;

a pressure-reduction unit connected to said etching chamber via an exhaust line;

a plasma-generating unit including a coil disposed along the outer periphery of and opposing said etching chamber, and a first RF power supply for applying high-frequency power to said coil, thereby to convert into plasma etching gas and protective-film-forming gas supplied into said etching chamber by said gas-supply unit;

a second RF power supply for applying high-frequency power to said base;

a gas flow controller connected to said mass-flow controllers in said gas-supply unit, said gas flow controller configured to control said mass-flow controllers so that said gas-supply unit delivers the etching gas into said etching chamber at an intermittent flow obeying a predetermined rectangular waveform varying between zero and a predetermined value, and delivers the protective-film-forming gas into said etching chamber at a continuous flow;

a coil-power controller for controlling the power applied by said first RF power supply to said coil in said plasma generating unit; and

a base-power controller for controlling the power applied by said second RF power supply to said base.

Claim 16 (previously presented): A silicon-substrate etching device according to claim 15, wherein said gas flow controller is further configured to increase the volume of the protective-film-forming gas that said gas flow controller delivers when said intermittent flow at which said gas flow controller delivers the etching gas is zero, and to decrease the volume of said protective film forming gas that said gas flow controller delivers when said intermittent flow at which said gas flow controller delivers the etching gas is goes to the predetermined value.

Claim 17 (previously presented): A silicon-substrate etching device according to claim 15, wherein said base-power controller is configured to control said second RF power supply to vary periodically the power said second RF power supply applies to said base, so that said second RF power supply applies lower power to said base when said intermittent flow at which said gas flow controller

delivers the etching gas is zero, and applies higher power to said base when said intermittent flow at which said gas flow controller delivers the etching gas goes to the predetermined value.

Claim 18 (previously presented): A silicon-substrate etching device for according to claim 15, wherein said coil-power controller is configured to control said first RF power supply to vary periodically the power said first RF power supply applies to said coil, so that said first RF power supply applies lower power to said coil when said intermittent flow at which said gas flow controller delivers the etching gas is zero, and applies higher power when said intermittent flow at which said gas flow controller delivers the etching gas goes to the predetermined value.

Claim 19 (currently amended): A device for etching a silicon substrate, the device comprising:

- an etching chamber for housing silicon substrates to be etched;

- a base on which the substrates are loaded, the base disposed in a bottom location inside said etching chamber;

- a gas-supply unit including etching and protective-film-forming gas cylinders and mass-flow controllers, said gas-supply unit connected to the etching chamber via gas-supply lines with said mass-flow controllers intervening;

- a pressure-reduction unit connected to said etching chamber via an exhaust line;

- a plasma-generating unit including a coil disposed along the outer periphery of and opposing said etching chamber, and a first RF power supply for applying high-

frequency power to said coil, thereby to convert into plasma etching gas and protective-film-forming gas supplied into said etching chamber by said gas-supply unit;

a second RF power supply for applying high-frequency power to said base;
a gas flow controller connected to said mass-flow controllers in said gas-supply unit, said gas flow control ~~means~~ controller configured to control said mass-flow controllers so that said gas-supply unit delivers the etching gas into said etching chamber at a volume-variant flow obeying a first predetermined rectangular waveform, and delivers the protective-film-forming gas into said etching chamber at a volume-variant flow obeying a second predetermined rectangular waveform whose phase is the inverse of that of said first predetermined rectangular waveform;

a coil-power controller for controlling the power applied by said first RF power supply to said coil in said plasma generating unit; and

a base-power controller for controlling the power applied by said second RF power supply to said base.

Claim 20 (previously presented): A silicon-substrate etching device according to claim 19, wherein said base-power controller is configured to control said second RF power supply to vary periodically the power said second RF power supply applies to said base, so that said second RF power supply applies lower power to said base during the troughs in the first predetermined rectangular waveform, as characterizing said volume-variant flow at which said gas flow

controller delivers the etching gas, and applies higher power to said base during the peaks in the first predetermined rectangular waveform.

Claim 21 (previously presented): A silicon-substrate etching device according to claim 19, wherein said coil-power controller is configured to control said first RF power supply to vary periodically the power said first RF power supply applies to said coil, so that said first RF power supply applies lower electrical power during the troughs in the first predetermined rectangular waveform, as characterizing said volume-variant flow at which said gas flow controller delivers the etching gas, and applies higher power to said coil during the peaks in the first predetermined rectangular waveform.

Claim 22 (previously presented): A device for etching a silicon substrate, the device comprising:

- an etching chamber for housing silicon substrates to be etched;

- a base on which the substrates are loaded, the base disposed in a bottom location inside said etching chamber;

- a gas-supply unit including etching and protective-film-forming gas cylinders and mass-flow controllers, said gas-supply unit connected to the etching chamber via gas-supply lines with said mass-flow controllers intervening;

- a pressure-reduction unit connected to said etching chamber via an exhaust line;

- a plasma-generating unit including a coil disposed along the outer periphery of and opposing said etching chamber, and a first RF power supply for applying high-

frequency power to said coil, thereby to convert into plasma etching gas and protective-film-forming gas supplied into said etching chamber by said gas-supply unit;

a second RF power supply for applying high-frequency power to said base;

a gas flow controller connected to said mass-flow controllers in said gas-supply unit, said gas flow controller configured to control said mass-flow controllers so that said gas-supply unit delivers the etching gas into said etching chamber at a first predetermined flow, and delivers the protective-film-forming gas into said etching chamber at a second predetermined flow;

a coil-power controller for controlling power applied by said first RF power supply to said coil in said plasma generating unit; and

a base-power controller configured to control said second RF power supply to vary periodically the power said second RF power supply applies to said base.

Claim 23 (previously presented): A silicon-substrate etching device for according to claim 22, wherein said coil-power controller is configured to control said first RF power supply to vary periodically the power said first RF power supply applies to said coil.

Claim 24 (previously presented): A device for etching a silicon substrate, the device comprising:

an etching chamber for housing silicon substrates to be etched;

a base on which the substrates are loaded, the base disposed in a bottom location inside said etching chamber;

a gas-supply unit including etching and protective-film-forming gas cylinders and mass-flow controllers, said gas-supply unit connected to the etching chamber via gas-supply lines with said mass-flow controllers intervening;

a pressure-reduction unit connected to said etching chamber via an exhaust line;

a plasma-generating unit including a coil disposed along the outer periphery of and opposing said etching chamber, and a first RF power supply for applying high-frequency power to said coil, thereby to convert into plasma etching gas and protective-film-forming gas supplied into said etching chamber by said gas-supply unit;

a second RF power supply for applying high-frequency power to said base;

a gas flow controller connected to said mass-flow controllers in said gas-supply unit, said gas flow controller configured to control said mass-flow controllers so that said gas-supply unit delivers the etching gas into said etching chamber at a first predetermined flow, and delivers the protective-film-forming gas into said etching chamber at a second predetermined flow;

a coil-power controller configured to control said first RF power supply to vary periodically the power said first RF power supply applies to said coil in said plasma generating unit; and

a base-power controller for controlling electrical power applied by said second RF power supply to said base.